CLAIMS

What is claimed is:

1. A method of forming a peer-to-peer, scalable bandwidth connection between a first computer system and a second computer system each connected to a public computer network, the method comprising the steps of:

establishing at least one physical point-to-point link between the first computer system and the public computer network, the first computer system link having a network address that is static and known to the second computer system;

establishing at least one physical point-to-point link between the second computer system and the public computer network, the second computer system link having a network address that is possibly unknown to the first computer system;

establishing an inferior virtual circuit to interconnect the first and second computer systems using the physical links and the public computer network;

establishing a superior virtual circuit between the first computer system and the second computer system, the superior virtual circuit comprising a plurality of inferior virtual circuits, each inferior virtual circuit including at least one unique physical point-to-point link not used by any other virtual link;

wherein the bandwidth of the superior virtual circuit is scaled by establishing additional physical point-to-point links between either the first or second computer system and the public network and establishing new inferior virtual circuit utilizing the additional physical point-to-point links; and

wherein the bandwidth available to the superior virtual circuit is equal to the minimum aggregate bandwidth of the available physical point-to-point links between either the first or second computer system.

2. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 1, wherein the superior virtual circuit is formed by encapsulating network protocol data with a security protocol.

3. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 2, wherein the security protocol is IPSec in tunnel mode.

4. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 3, wherein bundling is achieved through network layer packet fragmenting when the IPSec in tunnel mode is extensible through a firewall.

5. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 1, wherein, when the security protocol is blocked by a firewall, the security protocol is additionally encapsulated with a standard transport protocol to make the tunnel extensible through a firewall.

6. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 5, wherein the standard transport protocol is TCP.

7. A method of forming a peer-to-peer, scalable bandwidth connection between two computer systems connected to a public computer network as recited in claim 1, wherein the first computer system connects to the public computer network through a local area network.

APPENDIX

GLOSSARY OF TERMS AND ABBREVIATIONS

AH	Authentication Header
ADSL	Asymmetric Digital Subscriber Line
ASP	Application Service Provider
AUI	Attachment Unit Interface
BOD	Bandwidth on Demand
CD	Compact Disk
DES	Data Encryption Standard used in IPSec
DSL	Digital Subscriber Line
EPLD	Electrically Programmable Logic Device
ESP	Encapsulating Security Payload -
FIFO	First in First Out
GRE	Generic Router Encapsulation – a method of encapsulating layer 3 protocols over IP networks. GRE provides tunneling of layer 3 protocols.
IEEE	Institute of Electrical and Electronic Engineers
IETF	Internet Engineering Task Force
IP	Internet Protocol – the layer 3 protocol for the Internet
IPSec	Internet Protocol Security – a protocol for providing security services on IP networks. IPSec provides encryption and authentication services for a packet on an IP network. IPSec has two modes transport mode and tunnel mode.
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
KBPS	Kilo Bits Per Second
LAN	Local Area Network
L2F	Layer 2 Forwarding Protocol – a tunneling protocol using data link protocols such as ATM or Frame Relay.

L2TP	Layer Two Tunneling Protocol – a protocol derived from the PPTP protocol and L2F. The L2TP carries the PPP protocol traffic over non-point-to-point networks, such as the Internet.
MBPS	Mega Bits Per Second
	MIPS Millions of Instructions per second
ML-PPP	Multi-link Point-to-Point Protocol – a protocol that allows bundling of PPP connections onto a virtual link in order to increase bandwidth of the connection between the systems that are PPP connected.
NDR	Network Directed Routing
NIC	Network Interface Controller
PC	Personal Computer
PoP	Point of Presence – a point in the public switched telephone network used by the ISP to receive remote access requests
PPP	Point-to-Point Protocol – a datalink layer protocol for point-to-point connections. The PPP Protocol has three internal layers, the media dependent layer, the services layer and the multiplex layer. PPP is typically used to provide remote access over dial-up lines such as traditional phone lines and ISDN.
PPTP	Point-to-Point Tunneling Protocol – an earlier protocol than L2TP that specifies the tunneling of PPP. Tunneling is a method of encapsulating a lower level protocol in a higher level protocol.
PSTN	Public Switched Telephone Network
RAM	Random Access Memory
RFC	Request For Comments
TCP/IP	Transmission Control Protocol/Internet Protocol
3DES	Triple DES – a standard encryption method for IPSec
SDRAM	Synchronous Dynamic Random Access Memory
UART	Universal Asynchronous Receiver/Transmitter
UDP	User Data Protocol – a layer four protocol used on the Internet
T/A	Terminal Adapter

VPN Virtual Private Network – a network that simulates the properties of a private network using the facilities of a public network.

WAN Wide Area Network